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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/825,775

04/15/2004

Faith T. Chandler

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EXAMINER

BUSS, BENJAMIN J

ART UNIT

PAPER NUMBER

2129

DATE MAILED: 11/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/825,775

Applicant(s)

CHANDLER ET AL.

Examiner

Benjamin Buss

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6-16 and 18-69 is/are pending in the application.
- 4a) Of the above claim(s) 19-69 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-16 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

This Office Action is in response to an AMENDMENT entered 9/12/2006 for the patent application 10/825,775 filed on 4/15/2004 and claiming priority based on 60/479,696 filed on 6/18/2003. The First Office Action of 5/12/2006 is fully incorporated into this Final Office Action by reference.

Status of Claims

Claims 1-4, 6-16, and 18-69 are pending.

- Claims 19-69 have been withdrawn from consideration without prejudice.

Claim Rejections - 35 USC § 101

Response to Arguments

Applicant's arguments, see page 16, filed 9/12/2006, with respect to the rejection of claims 1-18 under 35 U.S.C. §101 have been fully considered and are persuasive. The rejection of claims 1-18 under 35 U.S.C. §101 has been withdrawn.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7-8, and 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over

APA: the admission of acknowledged prior art in the "Background of the Invention" in the specification of the instant application (page 2 line 1 – page 2 line 18) in view of

Sogg ("An Integrated Systems Approach to Human Factors in Commercial Aviation Maintenance Systems"),

Eiff ("At-Risk Safety Metric: A Proactive Safety Measurement Strategy"), and

Bieda (USPGP 2003/0171897).

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Claim 1:

As used in the claims, the terms "human" and "verb" are non-functional descriptive material that does not further limit the claim. Any description of a task will be interpreted to use a verb since a task implies an action, and therefore would logically be described using a verb. Transmitting and receiving are interpreted to include all forms of communication such as correspondence on paper, audio communication such as conversation, and electronic computer communications. Receiving is interpreted to include any generation of information. For clarity, Examiner has consecutively labeled each pending limitation of the independent claim with a letter a-l. The following rejection then clearly shows how each aspect of each claim limitation is completely and coherently met by the combination of the references.

APA teaches a method for performing human factors process failure modes and effects analysis for a process, the method comprising:

- (a) receiving inputs representing at least one task involved in the process, the task including at least one human activity ("tasks" p2 L11 – p3 L15) and described using at least one verb ("verb" p2 L11 – p3 L15);
- (c) at least one potential human error resulting from the human activity, the at least one potential human error resulting from the human activity being related to the at least one verb ("analyzes each task in a process to identify potential human errors" p2 L11 – p3 L15);
- (e) receiving an input representing a likelihood of occurrence of the human error ("likelihood of the errors" p2 L11 – p3 L15);
- (f) receiving a likelihood of correction of the human error ("likelihood based on barriers and controls" p2 L11 – p3 L15);
- (g) receiving a potential severity of an effect of the human error ("worst-case" p2 L11 – p3 L15);
- (h) calculating a risk of potential harm from the received inputs representing the likelihood of occurrence of the human error, the likelihood of correction of the human error, and the potential severity of the effect resulting from the human error ("likelihood of the worst-case effects on a system" p2 L11 – p3 L15);
- (k) receiving an input representing additional analysis of errors ("functional analysis, task analysis, root cause analysis, work methods analysis, risk assessment, human error identification, human error analysis" p3 L5-10); and

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As used in the claims, the terms "human" and "verb" are non-functional descriptive material that does not further limit the claim, but APA does meet the terminology of the claim.

APA fails to explicitly teach:

- (a-l) the use of a data processing device in the disclosed human factors analysis;
- (b) extracting, with the data processing device, the at least one verb from the received inputs representing the at least one task involved in the process;
- (c) searching, with the data processing device, a database;
- (d) transmitting, from the data processing device, an output representing the at least one potential human error;
- (i) comparing, at the data processing device, the calculated risk of potential harm with a risk threshold;
- (j) transmitting, from the data processing device, an output representing errors that exceed the risk threshold;
- (k) receiving, at the data processing unit, an input representing additional analysis of errors that exceed the risk threshold; and
- (l) transmitting, from the data processing device, an output representing a human factors process failure modes and effects analysis report.

Sogg teaches:

- (a) receiving at least one task involved in the process, the task including at least one human activity and described using at least one verb (p1-7 especially "human activity throughout the maintenance system" p2 and "maintenance operations" p3 and "Job/task" p6; Also see "Job/Task" in Figure 1; *It is clear that the tasks associated with maintenance would be described using verbs*);
- (b) extracting the at least one verb from the received inputs representing the at least one task involved in the process (p1-7 especially "human activity throughout the maintenance system" p2 and "maintenance operations" p3 and "Job/task" p6; Also see "Job/Task" in Figure 1; *It is clear that the tasks associated with maintenance would be described using verbs*);
- (c) at least one potential human error resulting from the human activity, the human error resulting from the human activity being related to the at least one verb extracted by the data processing device (p1-7 especially "human error" p3 and "job related hazards" p6);

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- (d) transmitting an output representing the at least one potential human error (p1-7 especially "identify those factors" p3);
- (e) receiving, at the data processing device, an input representing a likelihood of occurrence of the human error (p1-7 especially "error probability" p3);
- (f) receiving an input representing a likelihood of correction of the human error (p1-7 especially "conditions within the maintenance system that increase the possibility of error" p3 and "effect other system components have on the human's ability to do his/her job" p2 and "those performance shaping factors that resulted in the original error must be addressed before the risk of the maintenance error can be effectively managed" p4);
- (g) receiving an input representing a potential severity of an effect of the human error (p1-7 especially "potential outcome" p3);
- (h) calculating a risk of potential harm from the received inputs representing the likelihood of occurrence of the human error, the likelihood of correction of the human error, and the potential severity of the effect resulting from the human error (p1-7 especially "relative significance of the error" p3 and "risk assessments" p6);
- (i) comparing the calculated risk of potential harm with a risk threshold (p1-7 especially "most cost effective approach to managing it" p3 and "error tolerance" p4);
- (j) transmitting an output representing errors that exceed the risk threshold (p1-7 especially "most cost effective approach to managing it" p3 and "error tolerance" p4);
- (k) receiving, at the data processing unit, an input representing additional analysis of errors that exceed the risk threshold (p1-7 especially "maintenance organization can establish" p3 and "strategy designed" p4 and "strategy developed" p4); and
- (l) transmitting an output representing a human factors process failure modes and effects analysis report (p1-7 especially "communications" p7).

Motivation:

APA and **Sogg** are from the same field of endeavor, error and risk analysis. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined teachings of **APA** by comparing the level of risk to a risk threshold as taught by **Sogg** for the benefit of providing a significant

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115 economic advantage to a maintenance organization by both avoiding the costs associated with the human error and the direct reduction of costs resulting from increased workforce efficiency (**Sogg**, p1) and maximizing expected utility since a rational person out to pay no attention to very small chances (§2.2, **Shrader-Frechette** "Technological Risk and Small Probabilities") and also since a risk probability-threshold is economically necessary and desirable because the cost of not recognizing such a cut-off point often
 120 exceed those of recognizing it (§2.1, **Shrader-Frechette**).

The combination of **APA** and **Sogg** fails to explicitly teach:

- (a-l) the use of a data processing device in the disclosed human factors analysis;
- (c1) searching, with the data processing device, a database.

Eiff teaches:

- 125 - (a) receiving at least one task involved in the process, the task including at least one human activity and described using at least one verb (p1-15 especially "identify emerging error potentials" p6 and "Workers' at-risk behaviors" p7 and "level of unsafe acts" p7; Also see the use of verbs in the tables on pages 9-13);
- (b) extracting the at least one verb from the received inputs representing the at least one task involved in the process (p1-15 especially "identify emerging error potentials" p6 and "Workers' at-risk behaviors" p7
 130 and "level of unsafe acts" p7; Also see the use of verbs in the tables on pages 9-13);
- (c) searching a database for at least one potential human error resulting from the human activity, the human error resulting from the human activity being related to the at least one verb extracted by the data processing device (p1-15 especially "accidents" p3 and "personal injuries" p3 and "near-miss" p5 and "robust database" p5 and "compiling the data" p13);
- 135 - (d) transmitting an output representing the at least one potential human error (p1-15 especially "identify emerging error potentials" p6 and "Workers' at-risk behaviors" p7 and "level of unsafe acts" p7; Also see the use of verbs in the tables on pages 9-13);
- (e) receiving, at the data processing device, an input representing a likelihood of occurrence of the human error (p1-15 especially "trend safety levels" p5 and "identify common errors" p9);
- 140 - (k) receiving, at the data processing unit, an input representing additional analysis of errors that exceed the risk threshold (p1-15 especially "observation checklist data" p12); and

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- (l) transmitting, from the data processing device, an output representing a human factors process failure modes and effects analysis report (p1-7 especially "Weekly Totals" p13).

Motivation:

145 **Eiff** and the combination of **APA** and **Sogg** are from the same field of endeavor, error and risk analysis. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined teachings of **APA** and **Sogg** by developing and searching robust databases of errors/causes as taught by **Eiff** for the benefit of measuring and trending operational safety (**Eiff**, pages 1 & 5) and real-time assessment of "at-risk" worker behaviors and operational safety levels (**Eiff** p5) to identify the most

150 common sources of error and to trend the safety level over time to show progress (**Eiff** p7) and also to keep workers & management focused on safety, reduce equipment damage and personal injuries, and improve productivity (**Eiff** p14) and to promote targeted interventions (**Eiff** p5).

The combination of **APA**, **Sogg**, and **Eiff** fails to explicitly teach:

- (a-l) the use of a data processing device in the disclosed human factors analysis.

155 **Bieda** teaches:

- (a-l) using a data processing device (p1-12 especially ¶¶15,36) to help analyze potential process failures, including those dealing with human factors (especially "Operator" in Figure 8);
- (a) receiving, at the data processing device, inputs representing at least one task involved in the process (p1-12 especially ¶¶17,24,40,42,46,48);
- 160 - (b) extracting, with the data processing device, descriptions representing the at least one task involved in the process (p1-12 especially ¶¶40-41,47-48);
- (c) searching, with the data processing device, a database for at least one potential error resulting from the at least one task (p1-12 especially ¶¶14,18,39,49-50,53);
- (d) transmitting, from the data processing device, an output representing the at least one potential error
- 165 (p1-12 especially ¶¶54);
- (e) receiving, at the data processing device, an input representing a likelihood of occurrence of the error (p1-12 especially ¶¶19,54);
- (f) receiving, at the data processing device, an input representing a likelihood of correction of the error (p1-12 especially ¶¶20,81);

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- 170 - (g) receiving, at the data processing device, an input representing a potential severity of an effect of the error (p1-12 especially ¶¶21-22,56-57);
- (h) calculating, with the data processing device, a risk of potential harm from the received inputs representing the likelihood of occurrence of the error, the likelihood of correction of the error, and the potential severity of the effect resulting from the error (p1-12 especially ¶¶22,59);
- 175 - (i) comparing, at the data processing device, the calculated risk of potential harm with a risk threshold (p1-12 especially ¶59);
- (j) transmitting, from the data processing device, an output representing errors that exceed the risk threshold (p1-12 especially ¶59; *The person of ordinary skill in the art would have come to the logical conclusion that high risk assessments flagged for immediate attention would be output by the data*
- 180 *processing device*);
- (k) receiving, at the data processing unit, an input representing additional analysis of errors that exceed the risk threshold (p1-12 especially ¶¶60-70); and
- (l) transmitting, from the data processing device, an output representing a human factors process failure modes and effects analysis report (p1-12 especially ¶¶88-89).

185 Motivation:

Bieda and the combination of **APA**, **Sogg**, and **Eiff** are from the same field of endeavor, error and risk analysis. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined teachings of **Sogg** and **Eiff** by using a data processing unit to implement the error and risk analysis process as taught by **Bieda** for the benefit of plinking process information for use in root cause

190 and risk assessment decision making such that all quality and reliability information is traceable to all tasks and activities during the product development process while providing an understanding of the total cost of quality stored for future use, which simplifies future programs (**Bieda**, ¶¶24-25). Furthermore, the automation of the process by using a data processing device would be motivated by the benefit of taking advantage of the greater efficiency of the computer, compared to human processing, since computers are

195 decision-support systems quite capable of preparing reports and summaries to assist in decision making, enabling human beings to communicate directly with the CPU (**Eliason** "Online Business Computer Applications, Second Edition", p3-4).

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As claims 2-4, 6-16, and 18 depend upon claim 1, Examiner points out that these dependent claims rely upon the data processing device established above, which will not be addressed further.

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Claim 2:

Sogg teaches:

- wherein the inputs representing the at least one task include identifying a human-system interface (p1-7 especially "human-system interface" p2).

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Claim 3:

Eiff teaches:

- wherein the database is a potential human error database associating potential human errors with verbs useable describing the human activity involved in the task (p1-14 especially "No UAL approved hearing protection used" and "Inappropriate wands used" p11-12).

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Claim 4:

Eiff teaches:

- displaying the at least one potential human error in an error list (p1-14 especially "FOD walk not performed" and "Proper chocks not used immediately after blocked" and "Checklists" p9-10 and "FOD walk not performed" and "AMT not on gate/hanger for arrival" and "Fire extinguishers obstructed" p13).

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Claim 6:

Bieda teaches:

- quantifying the likelihoods and the potential severity (p1-12 especially ¶¶21-22,56-57).

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Claim 7:

APA teaches:

- wherein the input representing the potential severity of the human error includes a worst-case effect of the human error such that the risk of potential harm includes a risk of a worst-case effect of human error ("worst-case" p2 L11 – p3 L15).

Claim 8:

APA teaches:

- receiving an input representing mechanisms that allow at least one of detection ("identify human errors" p2 L11 – p3 L15), correction ("avoid the occurrence of errors or to reduce any harm the errors may cause" and "eliminate the errors or mitigate their effects" and "accommodate the limitations of personnel to produce safe, productive and comfortable use" p2 L11 – p3 L15), and prevention ("avoid the occurrence of errors or to reduce any harm the errors may cause" and "eliminate the errors or mitigate their effects" and "accommodate the limitations of personnel to produce safe, productive and comfortable use" p2 L11 – p3 L15) of the human error prior to the worst-case effect occurring.

Claim 9:

Sogg teaches:

- generating at least one performance-shaping factor for the human error that changes the likelihood that the human error will occur, the performance-shaping factor being related to the human activity involved in the task (p1-7 especially "factors that contribute to the likelihood that the error would occur" p4).

Claim 10:

Eiff teaches:

- displaying the at least one performance-shaping factor in a performance-shaping factor list from which a user can select at least one performance-shaping factor that changes the likelihood that the potential human error will occur (p1-14 especially "Root Causes" p10 and "Not Following Procedure" and "Incompatible Goals" p10-13).

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Claim 11:

APA teaches:

- generating at least one barrier directed to preventing the occurrence of the human error ("barriers" p2 L11 – p3 L15).

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Claim 12:

APA teaches:

- recalculating the risk of potential harm to include an effect of the barrier in preventing the occurrence of the human error ("likelihood based on barriers" p2 L11 – p3 L15).

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Claim 13:

APA teaches:

- generating at least one control directed to mitigating the effect of the human error ("controls" and "mitigate their effects" and "reduce and harm they may cause" and "recommendations" p2 L11 – p3 L15).

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Claim 14:

APA teaches:

- recalculating the risk of potential harm to include an effect of the control in mitigating the effect of the human error ("likelihood based on barriers and controls" p2 L11 – p3 L15).

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Claim 15:

APA teaches:

- recalculating the risk of potential harm to include human error probability data ("likelihood of the errors" and "risk assessment" p2 L11 – p3 L15).

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Claim 16:

Sogg teaches:

- identifying a recommendation that one of prevents the human error, allows mitigation the effect of the human error (p1-7 especially "mitigating a risk factor" p5), allows detection of the human error, and allows correction of the human error prior to the occurrence of the human error.

Claim 18:

Eiff teaches:

- the report includes and a table collecting results of the human factors process failure modes and effects analysis and risk assessment (p1-14 especially "Weekly Totals" p13).

Response to Arguments

Applicant's arguments with respect to claims 1-4, 6-16, and 18 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Claims 1-18 are rejected.

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Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed
305 to Benjamin Buss whose telephone number is 571-272-5831. The examiner can normally be reached on M-F 9AM-
5PM.

As detailed in MPEP 502.03, communications via Internet e-mail are at the discretion of the applicant.
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310 A paper copy of such correspondence will be placed in the appropriate patent application. The following is a sample
authorization form which may be used by applicant:

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Vincent
can be reached on 571-272-3080. The fax phone number for the organization where this application or proceeding
is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information
320 Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or
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BB

Benjamin Buss
Examiner
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11/14/06
DAVID VINCENT
SUPERVISORY PATENT EXAMINER